**Equilibrium – 1 – Translational Equilibrium**

Example 2: A 5.0kg box is lifted from the floor at a constant velocity of 3m/s. Draw a free body diagram and determine the values of the forces acting on the box.

Example 1: A 5.0kg box is sitting on the floor. Draw a free body diagram and determine the values of the forces acting on the box.

In both above examples:

The motion is

The forces are

When this is the case, it is said the object is at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

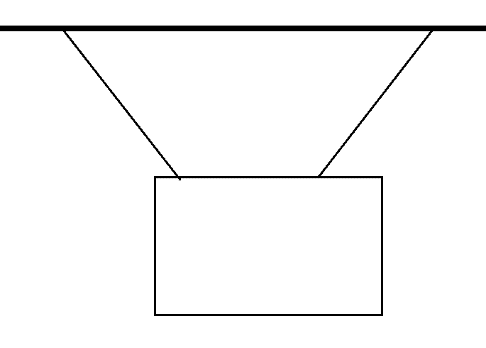
When an object is at rest it is at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

When an object is moving at a constant velocity it is at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

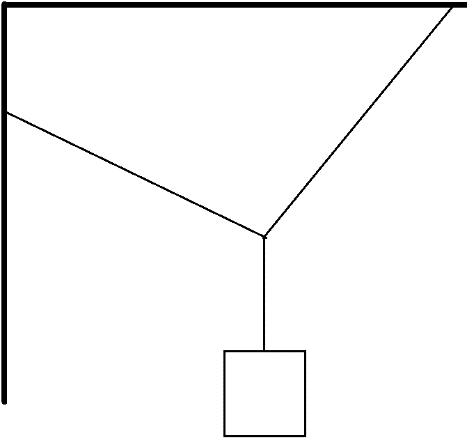
In both of the examples, the object was in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ equilibrium

Translation refers to moving in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ie. )

Therefore, the conditions for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are:



**FNET =**



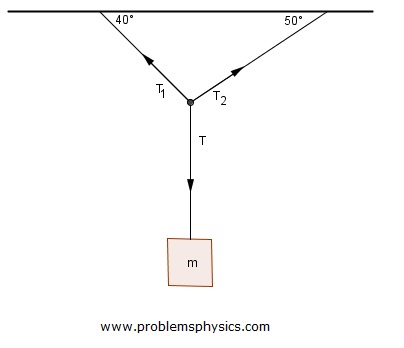
OR

**FNET X =**

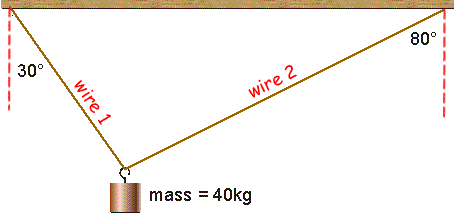
**FNET Y =**

**How to solve with components**

1. Identify. Is this situation in equilibrium?
2. Draw a FBD, look for where the forces intersect.
3. Break the forces into components.
4. Use FNET to solve for your unknowns.

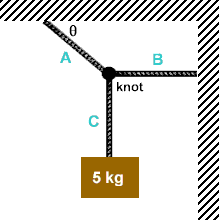
T1=50N. Determine the mass of the block.

**How to solve with trig**

1. Identify. Is this situation in equilibrium?
2. Draw a FBD
3. Turn your vectors into a ***triangle***. Situations in equilibrium should have zero net force, thus should always end where they started.
4. Use Sine and Cosine Laws to solve for your unknowns.

Determine the tensions in the two wires.

**Example**: Determine the tension in rope B when the angle θ=25°.



**Example**: What is the mass of the traffic light if string AB has 150N of tension?

